

Choosing a Planting Location

Planning Before Planting

A beautiful landscape owes its success to many types of care and considerations. Chief among them is a keen assessment and understanding of the particular conditions of the landscape site. No matter how attractive and healthy when chosen, or how well tended once in the ground, if the plant is not suited to the site it may be a serious disappointment. When choosing plants for your home landscape, it is important to consider the

following factors: the planting site's climate and micro-climates; the amounts of direct and indirect sunlight received throughout the day; exposure to wind and, in coastal areas, salt; various characteristics of the soil and the underground environment; and of course, man-made components like utility lines, signs, fences and buildings. In the long run, proper planning will help give your trees a longer life.

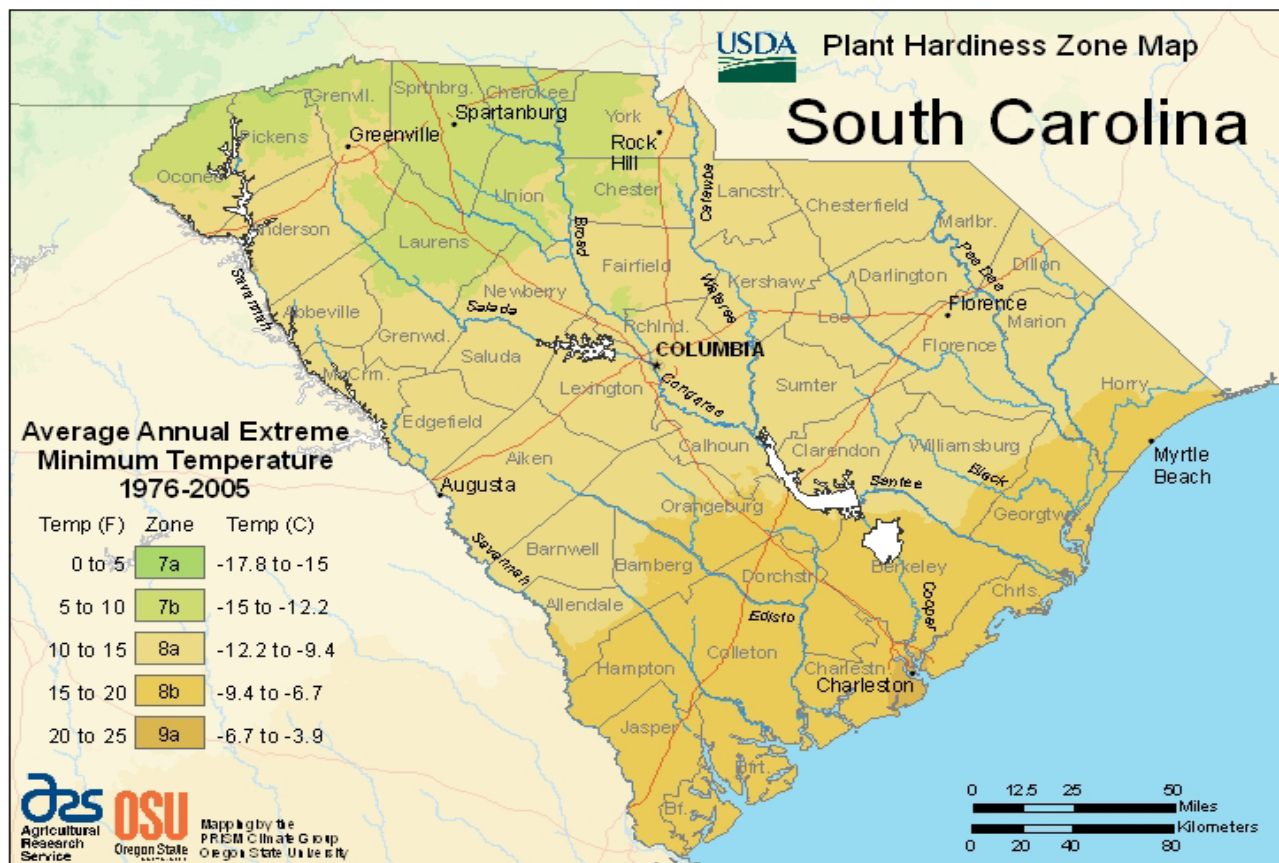


Figure 1. USDA Plant Hardiness Zone Map
(<http://planthardiness.ars.usda.gov/PHZMWeb/Default.aspx>)

Climate: The plants you select should be cold hardy in the appropriate climate zone. The country is defined in a series of zones, based on the average minimum winter temperature. A plant that is adapted to your hardiness zone is one that can tolerate the lowest winter temperature your zone usually experiences. Refer to Figure 1 to determine the zone for your county in South Carolina.

Along with cold winter hardiness, plants need to be able to tolerate maximum summer temperatures. Trees and shrubs that are not adapted to these temperatures may have poor vigor and decline over time. If you have questions about a specific tree or shrub for your area, contact the Home & Garden Information Center at 1-888-656-9988.

In addition to the larger climate that governs the planting site, plants will be affected by micro-climates (little pockets of weather specific to certain parts of your property). In general, minimum winter temperatures occur on the north side of a house and maximum summer temperatures are reached on unshaded western exposures. Southern exposures will be the warmest during the winter. On the south side of a house, temperature changes in a given day in winter can be dramatic and may predispose plants to winter damage by stimulating new growth that cannot tolerate a sudden drop in temperature.

Tree canopies protect neighboring plants by reducing their radiant heat loss. In winter, the microclimate beneath a tree may be several degrees warmer than the surrounding air, and this small increase in temperature could keep some plants alive. Furthermore, the tree's shade during the early morning slows the rate of thaw and can reduce the amount of cold damage to some species. Building overhangs, arbors and fences may provide similar kinds of protection.

Above-Ground Site Analysis

Exposure to Sunlight: All plants require some amount of sunlight, but some species need many hours of full sun while others do best largely in shade. Before choosing plants for your landscape, observe how many hours of sun and shade various parts of the site receive. Remember to take into account that the angle of the sun changes with the time of year and that you will probably have more hours of direct sun in summer than in other seasons.

Plants requiring full sun usually need at least six hours daily of direct sun and often produce the best form and growth if they receive sun all day. Plants that can tolerate full sun to partial sun/partial shade will need around three to four hours of direct sun. Trees and shrubs that tolerate shade will perform best in filtered/partial sun rather than full shade. Shade-loving plants adapt to sites with less than two hours of direct sun in early morning or with filtered sun/filtered shade. Shade-loving perennials and groundcovers are better suited for heavily shaded locations with less than two hours of morning sun.

Wind: Wind increases the amount of water loss from a plant to the atmosphere. The root systems of plants growing in confined situations dry out the soil quickly, and the plants are then susceptible to further drought stress from the wind. Plants in very sandy, well-drained soils are likewise vulnerable. Well-managed irrigation can partially overcome such water deficits but may be difficult to accomplish in highly urbanized sites. The best way to manage water loss on a windy site is by selecting species tolerant of drought. If soil on such a site is poorly drained, select a species that can tolerate both dry and wet soil.

Salt: Airborne salt can affect plant twigs and leaves or, after being deposited on the ground, their roots. Plants within a quarter of a mile of saltwater coastlines should possess some degree of tolerance to salt spray. Those exposed to direct spray along the dunes will need to be highly salt-tolerant. Salt-tolerant plants are often deformed by direct exposure to salty air, but they can survive and grow. Salt-sensitive plants grow poorly or die when exposed to salty air.

Overhead Power Lines: To provide unobstructed tree growth, only trees that are small at maturity should be planted directly under or within 6 feet of overhead lines. Refer to Figure 2 for planting distance recommendations around utilities. Be aware that even a 50-foot buffer may be too close for trees with a large canopy. Check the mature canopy size of the tree species before you plant. By choosing appropriate species, one can avoid having trees topped by the utility company, as well as damage to overhead power, phone or cable lines.

Buildings: If planting under the eaves of a building, be aware that plants will receive little or no rainfall if the building has gutters. The soil may then

become too dry to support good root growth unless irrigation is regularly supplied. If a building has no gutters, water running off the roof may supply plants in the immediate vicinity with several hundred inches of rainfall every year instead of the usual 50 to 60 inches. Locate plants so that water cascading off a roof will not land directly on the plants.

Most perennials and vines can be planted to within a foot of a building, as their roots will not grow large enough to damage the foundation. However, trees and shrubs planted near the house foundation should have enough room to reach a mature width, leaving a 12- to 18- inch air gap next to the wall.

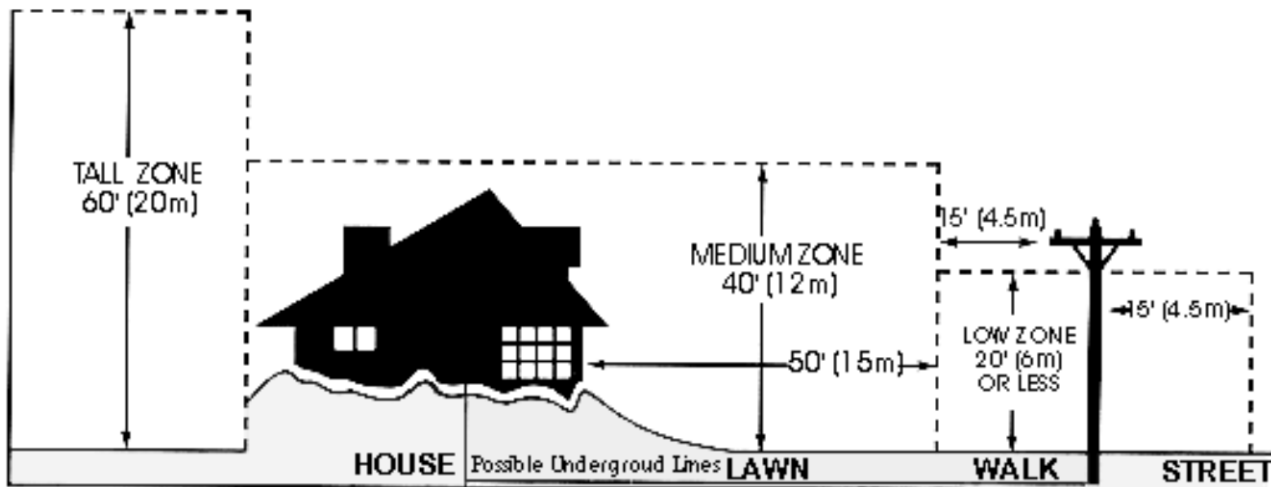


Figure 2. Planting guidelines for around above- and below-ground utilities. Excerpted From Avoiding Tree and Utility Conflicts by International Society of Arboriculture. http://www.treesaregood.com/treecare/avoiding_conflicts.aspx

This will allow adequate air circulation for house foundation vents and helps prevent mildew. Proper spacing also prevents shrubs from becoming one-sided and appearing jammed against the building when mature. See fact sheet [HGIC 1702, Foundation Plantings](#) for more information.

Trees are most stable when they develop a uniform root system distributed more or less evenly in every direction from the trunk. The unbalanced root system that develops when roots meet a building wall can reduce the wind firmness of the tree. Large-maturing trees planted within 10 feet of a one- or two-story building can blow over, especially if wind comes from the building side of the tree. In most cases, planting a tree less than 15 feet from a building is not a good idea. As a general rule, trees develop very extensive root systems, spreading two to three times the width of the tree or more.

Existing Trees: When young trees or shrubs that require full sun are planted under or near the canopy of established trees, they will bend in the direction of the sunlight and become deformed. Choose shade-tolerant plants for planting in the shade of established trees. Avoid planting close to the trunk of an established tree. Tree roots spread outward

two to three times the width of the canopy. Severing one major root when digging around a tree can cause the loss of 5 - 20 percent of the root system.

Below-Ground Site Analysis

Soil of good quality is precious and should not be wasted. When deciding to build on a site, advanced planning (before construction starts) enables you to identify and preserve good soil. Make provisions to save and store high-quality soil for use when construction is completed. Do not permit this soil to be taken away or buried. Work with contractors to prevent excessive soil compaction in areas where trees will be planted. Isolate these areas with heavy fences.

More frequently one must select plants for a site where construction has already been completed and the soil and ground have been modified by heavy equipment. Simply layering soil over compacted soil will not promote good plant growth. Break up compacted soil and mix with loose soil. Examine soil throughout the planting site and test each different type you find. Have the soil tested through the county Extension office.

Soil pH: The [pH](#) level of the soil is the most important component of a soil test, so do not try to guess the level. Never apply lime without testing your soil first. Conduct soil tests in several areas of the planting site. The pH may be lower or higher next to a building because of sand or other materials used near the footings.

Soil Texture: While soil texture is not in itself a growth-limiting factor, it does indicate other soil attributes that influence plant growth. Clay with its dense texture may drain poorly if the terrain is flat or the soil has been compacted by heavy equipment. When planting in clayey soil, you must know whether drainage is poor or good to select plants that are adapted to the level of moisture that will prevail. On the other hand, many sandy soils drain quickly and, if irrigation cannot be provided on a regular basis after plants are established, drought-resistant species should be chosen for the site.

Nitrogen, potassium and other essential elements are leached more quickly through sandy soils. A controlled, slow-release fertilizer is recommended for sandy soil because soluble, fast-release nitrogen fertilizers leach quickly. Consider choosing a species native or adapted to a sandy soil type. Such plants may be more tolerant of soils with a lower nutrient content.

Soil Drainage: Soil drainage is determined by soil type, compaction, and distance to water table. There are two types of drainage to inspect at the planting site: surface and internal. Proper surface grading will allow water to penetrate the soil evenly and direct run-off away from unwanted areas to prevent pooling. Clay soils and compacted surfaces will cause more water run-off than sandy soils. To redirect run-off, construct swales or gentle slopes in the landscape to direct water to a desired location.

Internal soil drainage is an important factor for optimum root development. Most plants prefer a well-drained soil. Well-drained soils provide adequate water and oxygen to plant roots. Poor drainage can result in poor root development due to low oxygen levels.

Compacted Low-Oxygen Soils: Compacted and poorly drained soils contain little oxygen, which plant roots need in order to survive and grow. Though some plants tolerate soils with low oxygen,

most grow poorly or die. Although any type of soil can become compacted, clayey offers plants the most difficult challenge.

To check for compaction and drainage of the planting site, dig a hole at least 12 inches deep and 12 inches wide in each section of your planting site. Soil that is difficult to dig may be compacted; if a pickaxe must be used, soil is probably too compacted for planting without taking corrective measures. If the soil is fairly easy to dig with a shovel, it is probably not compacted. Fill the holes with water. If water stands in the hole for 6 hours or more, the site has poor drainage. Improve compacted and poorly drained soils by tilling. Do not till under the dripline of trees and shrubs or you will cause serious damage to their root systems.

If plants that cannot tolerate wet roots must be planted on a site with poor soil drainage, a mound known as a berm can be created to elevate the plant's root systems (see Figure 3). Although its use may be the only option, making a berm is not an ideal solution because of the various problems it entails. Successful use of this landscaping technique requires intelligent advance planning. The right plant in the right space is the ultimate key to success.

Subsurface Compacted Layers: Soil that has been loosely spread over a compacted soil creates special challenges. Roots often grow only in the loose soil and fail to penetrate the compacted subsoil. The resulting shallow root system can create unstable and potentially hazardous large trees. Consequently, only small and medium-sized trees are recommended for planting where less than 2 feet of loose soil will be spread over compacted subsoil.

In landscapes with subsurface compacted layers, the lowest areas are likely to be wet during certain times of the year. Within a day or two after a significant rainfall, evaluate the site and decide if choosing plants tolerant of wet sites will be necessary. If this kind of evaluation is conducted during a drier time of the year, you may mistakenly conclude that your drainage is fine.

Soil Salinity: Some soils in coastal areas have a high salt content. If you are unfamiliar with the area or suspect that salts could be a problem, have the soil tested. Be mindful that irrigation water may

also be salty. When using well water along the coast, have it tested. If good water is not available, choose salt-tolerant plants or those that have been

growing well in your area with the same irrigation water.

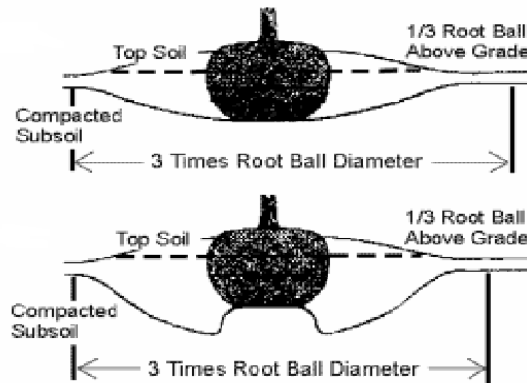


Figure 3. For poorly drained soil, plant trees with one-third of root ball above original grade, see examples above. Excerpted from Newly Planted Trees: Strategies for Survival Forestry Leaflet 17, by Don Ham and Larry Nelson, Clemson University.

Soil Depth: In the ideal planting site, the layer of soil above bedrock would be at least 5 or 6 feet deep. Dig a hole to learn the depth of your soil layer. If bedrock comes close to the surface or if for other reasons there is little soil, plant trees that are small to medium-sized at maturity. Large maturing trees planted in shallow soil are likely to form large surface roots, which can disrupt foundations, drive-ways, sidewalks, curbing and gardens. Furthermore, large trees with shallow root systems can topple over in storms.

Distance to the Water Table: Below-ground variations of a planting site and the surrounding terrain affect the distance between the soil surface and the top of the water table in a given locale. The distance to the water table often varies throughout the year; you may find that the water table that was within inches of the surface in one season has dropped several feet below it during another season. For the purposes of plant selection, sites with water within a foot or two of the soil surface during part of the year should be treated as poorly drained.

To determine the distance to the water table, use a shovel, four-inch auger, or backhoe, to dig several holes two to three feet deep around your planting site. Wait two hours. If water appears in the hole, the water table is high, suggesting a need to select plants that tolerate wet sites. See fact sheet [HGIC 1718, Plants for Damp or Wet Areas](#) for more information.

If the distance from the soil surface to the surface of the water is less than 18 inches, only small or medium-sized wet-site trees are recommended. Large maturing trees will adapt to wet sites by developing shallow root systems and can then become unstable in storms. The possible exceptions are trees that grow with submerged root systems, such as baldcypress (*Taxodium distichum*) and black gum (*Nyssa sylvatica*). If no water appears in the hole, you will not have to consider the water table in choosing plants for that site.

Underground Utilities: Before any digging or planting, determine the location of underground electric, telephone and television cables as well as water, sewer and gas lines. In South Carolina, call 811 (SC811 [<http://www.sc1pups.org/>]). Member companies will mark underground lines within 3 business days (not including the day of the call). Once the utilities have been marked, you will know their approximate location and can dig safely. Digging holes without regard for underground utilities risks serious personal injury as well as damage to the lines. The person(s) causing the damage must pay for repairs.

Trees that are large at maturity should be planted at least 12 feet from major underground utility lines; the rule-of-thumb is to plant as far away as possible. No tree should be planted directly on top of a utility line because it might be damaged or need removal if the line needs servicing.

Medium- to large-maturing trees planted near septic tanks and drain fields can cause damage with their roots. Although the roots of small-maturing trees and shrubs can also invade septic tanks, they seldom cause extensive problems. To be safe, plant a tree at least as far from a potential underground trouble spot as the diameter of its canopy at maturity. For example, a tree expected to produce a canopy 40 feet in diameter should be planted 40 feet from a septic tank or drain field.

Site Preparation & Soil Amendments

Many planting sites need to be prepared before planting begins. Preparations may include grading, tilling compacted soil, installation of irrigation or other utilities, the addition of gutters to a roof to control runoff during heavy rains, terracing to retain runoff, amending soil or other projects that will affect the nature or viability of the planting site.

The first step to take in preparing the site is grading the soil to achieve the desired landform. It is important at this stage to create adequate surface drainage that directs water flow away from structures and planting beds and into an appropriate water path for the area.

Loosen compacted soil by plowing or tilling, increasing the rate of root growth and root penetration into the landscape soil. This speeds up establishment time and reduces the period of the tree's vulnerability to pests, disease and drought.

Loosen the soil 15 to 20 feet or more in diameter around the area where the tree will be planted.

Most landscape soils are not modified with soil amendments prior to planting, and the plants grow well. However, amendments may serve to adjust the soil pH to a desirable range (although the effect is usually temporary), to add nutrient elements or to temporarily increase organic matter. Because it promotes rapid root growth, composted organic matter is a good amendment for large planting beds containing groups of shrubs. However, individual planting holes for trees and shrubs usually do not need amendments.

Excerpted from the *South Carolina Master Gardener Training Manual*, EC 678.

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